

**MIO-400KF Rev. F
All-In-One
Input/Output Board
User's Manual**

- D11420130 -

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❖ **FCC Statement on Class B**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio TV technician for help.*

Notice:

- (1) *The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*
- (2) *Shielded interface cables must be used in order to comply with the emission limits.*

❖ Table of Contents ❖

Introduction.....	1-1
Features.....	1-1
Package Checklist.....	1-3
Board Layout.....	2-1
Ports and Connectors.....	3-1
Serial Ports.....	3-1
Jumper Settings.....	3-2
Connecting the Secondary Serial Port.....	3-8
Parallel Port.....	3-9
Jumper Settings.....	3-10
Floppy Disk Drive Controller.....	3-12
Jumper Settings.....	3-12
Connecting the Floppy Disk Cable.....	3-13
IDE Hard Disk Interface.....	3-14
Jumper Settings.....	3-14
Connecting the IDE Hard Disk Cable.....	3-15
Adding a Second IDE Hard Drive.....	3-16
Preparing an IDE Drive for Use.....	3-17
Game Port.....	3-17
Jumper Settings.....	3-17
Connecting the Game Port Cable.....	3-18
Installing the MIO-400KF into your System.....	4-1
Appendix A: Connector Pin Assignments.....	A-1

❖ Introduction

The MIO-400KF all-in-one I/O board is your serial/parallel ports, game port and FDD/HDD controllers on a single board. It eliminates the need to buy separate boards for your parallel and serial ports, game port, and FDD and IDE HDD controllers. This board uses one of the most popular AIO I/O chips in the market today, the M5105 chip.

Setting up the board is easy. The MIO-400KF expansion board is equipped with simple and clearly marked jumpers onboard and can be installed in any open 16-bit expansion slot of an IBM AT or 100% compatible system.

Features

• Serial Ports

Two RS-232C serial ports

Supports COM1, COM2, COM3 and COM4 ports addressed at 3F8-3FF, 2F8-2FF, 3E8-3EF and 2E8-2EF

Interrupt request channel selectable (IRQ2-IRQ5)

Equipped with enable/disable function

Includes a 9-pin connector with cable for the secondary serial port

Configuration:	Primary	Secondary
	COM1	COM2
	COM2	COM3
	COM3	COM4
	COM1	COM4
	disable	disable

- ***Parallel Printer Port***

One parallel printer port (25-pin female connector)
Supports LPT1, LPT2 and LPT3 ports addressed at
3BC- 3BE, 378-37A and 278-27A HEX
Supports IRQ5 and IRQ7 Interrupt Request Lines
Equipped with enable/disable function

- ***Floppy Disk Controller***

Supports two standard type floppy disk drives
Supports 360KB/1.2MB 5.25-inch and 720KB/1.44MB
3.5-inch floppy disk drives
Equipped with enable/disable function

- ***IDE Hard Disk Interface***

Interfaces two IDE hard disk drives
Equipped with enable/disable function

- ***Game Port***

One game port
Includes a 15-pin game port cable
Equipped with enable/disable function

- ***One metal bracket to mount the 9-pin secondary serial port and the 15-pin game port***

- ***Two-layer P.C.B.***

- ***One year warranty***

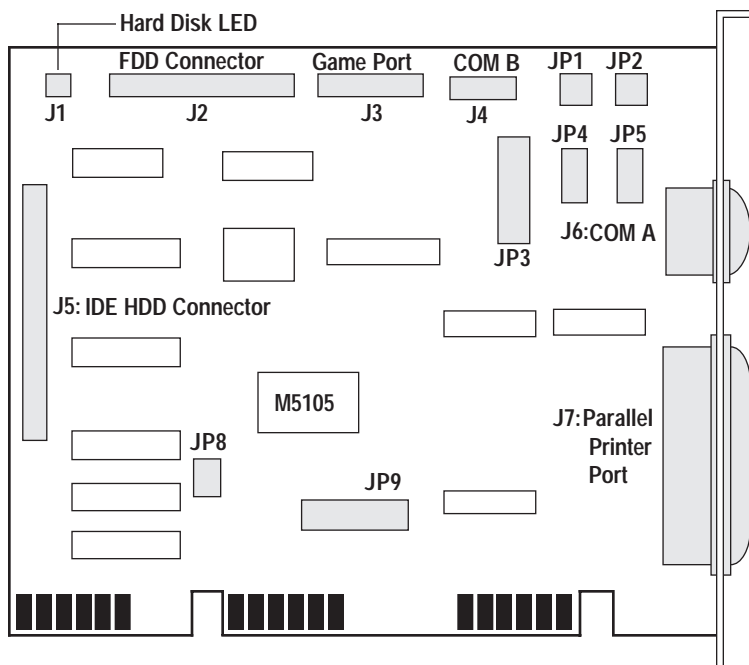
Package Checklist

Check and make sure that your MIO-400KF package contains the following items:

- . MIO-400KF all-in-one I/O board
- . One 9-pin serial port cable
- . One 15-pin game port cable
- . One metal bracket to mount the 9-pin secondary serial port and the 15-pin game port cables
- . MIO-400KF user's manual
- . One 34-pin floppy disk drive cable (optional)
- . One 40-pin IDE hard disk drive cable (optional)

If anything is missing, consult your dealer.

◆ Board Layout



The MIO-400KF Board

❖ Ports and Connectors

The MIO-400KF board is equipped with two RS-232C serial ports, one parallel port, one FDD controller, one IDE hard disk interface, and one game port. This board can be installed in any open 16-bit expansion slot of an IBM AT or any 100% compatible system.

Caution:

Computer components are easily damaged by static electricity. Handle the MIO-400KF all-in-one I/O board only by its edges. Do not touch any of the metal circuitry, especially the gold contacts, with your hands.

Serial Ports

The built-in serial ports are RS-232C asynchronous serial communication ports that can be used with modems, serial printers, remote display terminals and other serial devices. You can select any of the interrupt request lines supported, IRQ2 to IRQ5, by configuring jumper JP9. Included in the package is a 9-pin connector attached to a 9-pin cable and a metal bracket to mount the secondary serial port.

The serial ports on your MIO-400KF board uses the following system I/O addresses:

Port Configuration	I/O Address
COM1	3F8-3FF Hex
COM2	2F8-2FF Hex
COM3	3E8-3EF Hex
COM4	2E8-2EF Hex

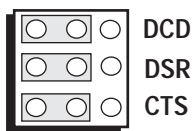
Jumper Settings

Primary Serial Port

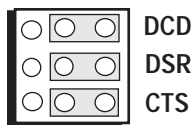
Jumper JP1

Normal/Forced True Setting

Jumper JP1 configures the primary serial port's normal or forced true setting. Default is set to "normal".



**Normal
(Default)**

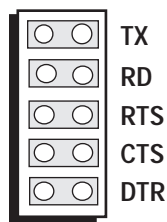


Forced True

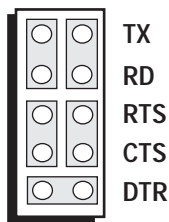
Jumper JP5

DTE/DCE Setting

Jumper JP5 configures the primary serial port's DTE/DCE setting. Default is set to "DTE".



**DTE
(Default)**



DCE

Secondary Serial Port

Jumper JP2

Normal/Forced True Setting

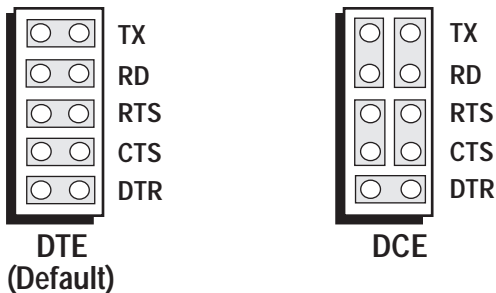
Jumper JP2 configures the secondary serial port's normal or forced true setting. Default is set to "normal".



Jumper JP4

DTE/DCE Setting

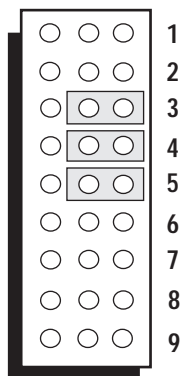
Jumper JP4 configures the secondary serial port's DTE/DCE setting. Default is set to "DTE".



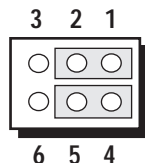
Jumper Block JP3 and Jumper JP8

Serial Port Configuration

JP3 is a jumper block on the MIO-400KF board that is used to configure the ports and connectors built-in to the board. Jumper JP8 should be configured in conjunction with jumper JP3 to set the serial ports to the desired I/O addresses. Rows 3, 4 and 5 of jumper JP3 will be used to configure the serial ports.

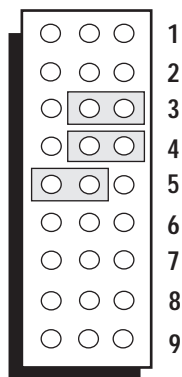


Jumper JP3

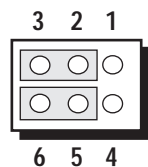


Jumper JP8

COM A: COM1
COM B: COM2
(Default)

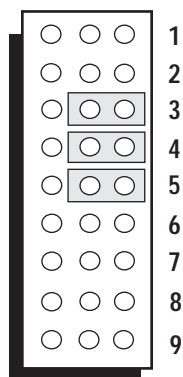


Jumper JP3

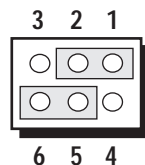


Jumper JP8

COM A: COM2
COM B: COM3

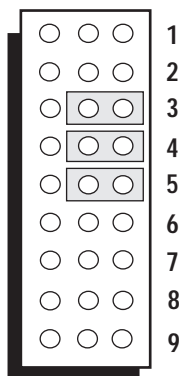


Jumper JP3

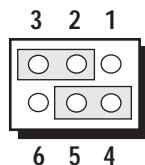


Jumper JP8

COM A: COM1
COM B: COM4

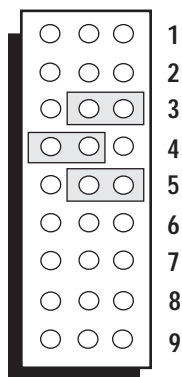


Jumper JP3

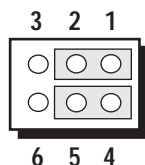


Jumper JP8

COM A: COM3
COM B: COM4

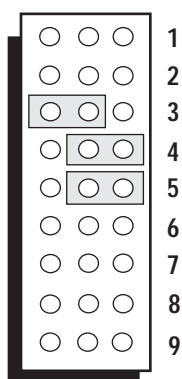


Jumper JP3

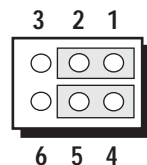


Jumper JP8

COM A: COM1
COM B: Disabled

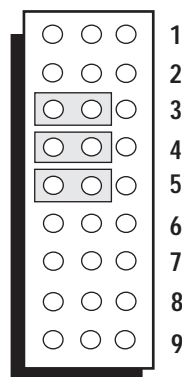


Jumper JP3

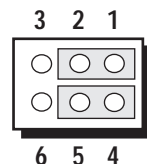


Jumper JP8

COM A: Disabled
COM B: COM2



Jumper JP3

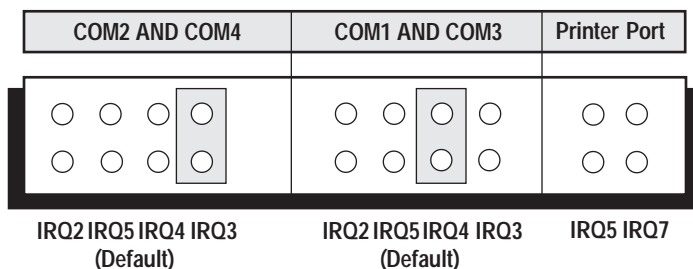


Jumper JP8

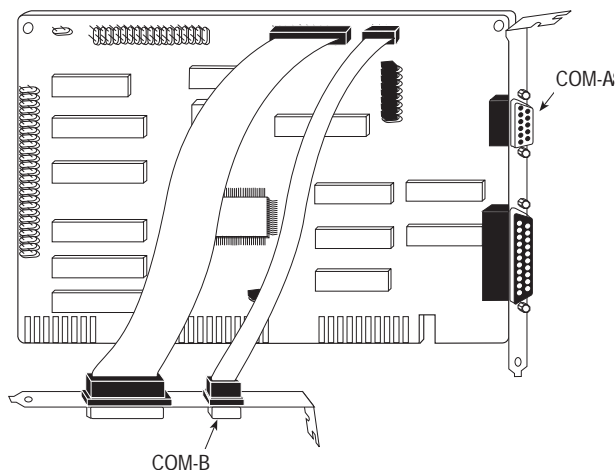
COM A: Disabled
COM B: Disabled

Jumper JP9**Serial Ports IRQ Line Settings**

The serial ports are each assigned to an IRQ line that corresponds to the I/O addresses configured to the serial ports. The default IRQ line for COM1 and COM3 is IRQ4, and IRQ3 for COM2 and COM4.

***Connecting the Secondary Serial Port***

The primary serial port (COM A) is already built-in to the MIO-400KF board. Insert the secondary serial port cable (COM B) in connector J4. Make sure that the colored edge of the cable is aligned to pin 1 of the J4 connector. Refer to the figure on the next page.



The Primary and Secondary Serial Ports on the MIO-400KF Board

Parallel Port

The MIO-400KF board has a standard feature for interfacing your PC to a parallel printer. This port is completely compatible with the IBM AT and uses the same female DB25 parallel port.

The parallel printer port on your MIO-400KF board uses the following system I/O ports and addresses:

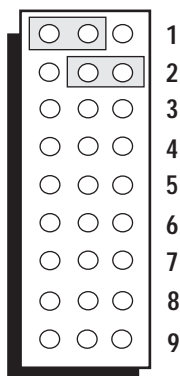
Port Configuration	I/O Address
LPT1	3BC-3BE Hex
LPT2	378-37A Hex
LPT3	278-27A Hex

Jumper Settings

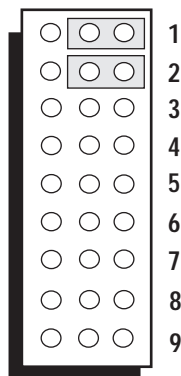
Jumper Block JP3

Parallel Port Configuration

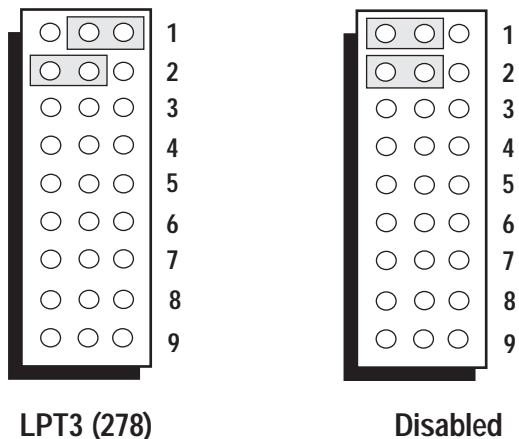
JP3 is a jumper block on the MIO-400KF board that is used to configure the ports and connectors built-in to the board. Rows 1 and 2 of jumper JP3 are used to configure the parallel port. These will set the parallel port to its desired printer port I/O address.



LPT1 (3BC)



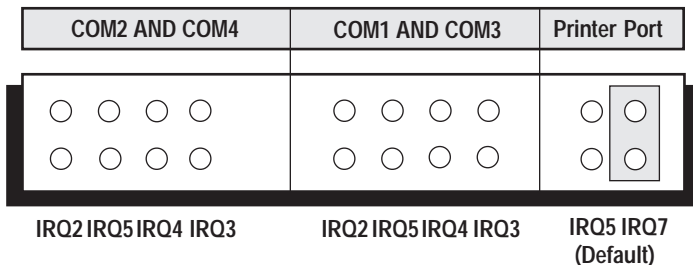
**LPT2 (378)
(Default)**



Jumper JP9

Parallel Port IRQ Line Setting

An IRQ line must be selected for the parallel port. Set IRQ level to IRQ7 when the parallel port is configured to LPT1/LPT2 and IRQ5 when configured to LPT3. Default is set to IRQ7 for LPT2, the default parallel port.



Note:

To avoid any conflicts, set LPT1/LPT2 to IRQ7 and LPT3 to IRQ5

Floppy Disk Controller

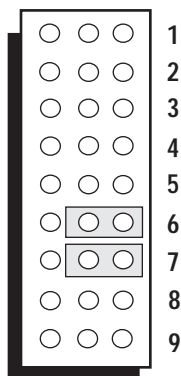
The MIO-400KF board is equipped with a built-in floppy disk controller that supports two standard type floppy disk drives. You can install any 360KB/1.2MB 5.25-inch and/or 720KB/1.44MB 3.5-inch floppy disk drives.

Jumper Settings

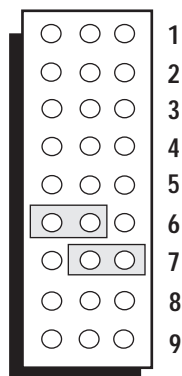
Jumper Block JP3

Floppy Disk Controller Enabled/Disabled

JP3 is a jumper block on the MIO-400KF board that is used to configure the ports and connectors built-in to the board. Rows 6 and 7 are used to enable or disable the floppy disk controller. When another floppy disk controller board is used in conjunction with the MIO-400KF board, the floppy disk controller function on the MIO-400KF board must be disabled to avoid conflicts with the other FDD board.

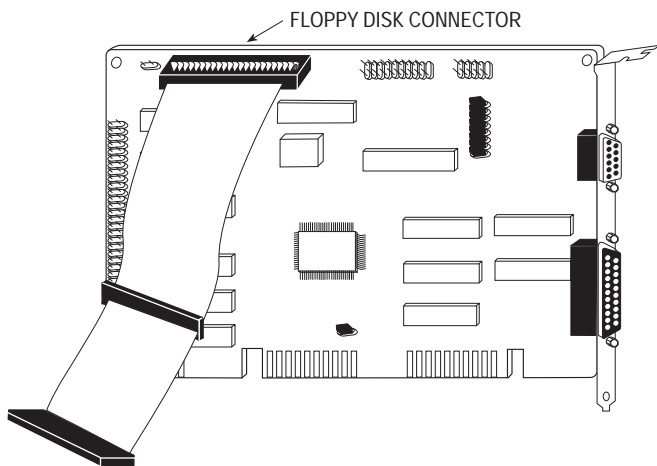


**Enabled
(Default)**



Disabled

Connecting the Floppy Disk Cable



The Floppy Disk Connector on the MIO-400KF Board

Step 1

Install the 34-pin header connector into the floppy disk connector (J2) on the MIO-400KF board with the colored edge of the ribbon aligned to pin 1.

Step 2

Install the other 34-pin header connector(s) into the disk drive(s) with the colored edge of the daisy chained ribbon cable aligned to pin 1 of the drive edge connector(s).

IDE Hard Disk Interface

The MIO-400KF board will interface two IDE (Integrated Drive Electronics) hard disk drives. An IDE drive is a hard drive with the controller electronics built into the disk assembly. The integration of the controller and the drive as a single unit increases both the reliability and performance by eliminating redundant circuitry.

Note:

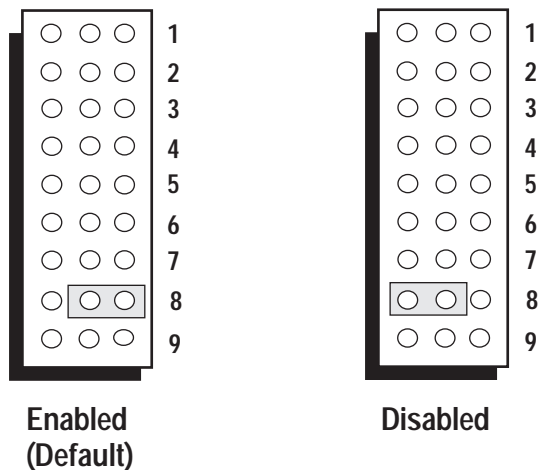
Co-existence of non-IDE drives is not supported.

Jumper Settings

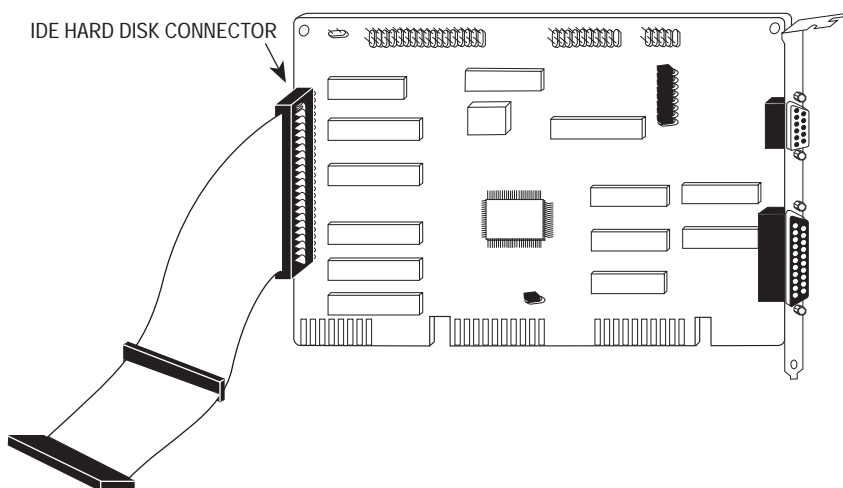
Jumper Block JP3

IDE Hard Disk Interface Enabled/Disabled

JP3 is a jumper block on the MIO-400KF board that is used to configure the ports and connectors built-in to the board. Row 8 is used to enable or disable the IDE hard disk interface. When another IDE hard disk interface board is used in conjunction with the MIO-400KF board, the IDE hard disk interface function on the MIO-400KF board must be disabled to avoid conflicts with the other IDE HDD board.



Connecting the IDE Hard Disk Cable



The IDE Hard Disk Connector on the MIO-400KF

Step 1

Install the 40-pin header connector into the hard disk connector (J5) on the MIO-400KF board with the colored edge of the ribbon aligned to pin 1.

Step 2

Install the other 40-pin header connector(s) into the disk drive(s) with the colored edge of the daisy chained ribbon cable aligned to pin 1 of the drive edge connector(s).

Note:

Refer to your disk drive user's manual for information about selecting the proper switch settings.

Adding a Second IDE Hard Drive

When using two IDE drives, one must be set as the master and the other drive as the slave. Follow the instructions provided by the drive manufacturer for setting the jumpers and/or switches on the drives. No changes are needed on the MIO-400KF board when adding a second hard drive.

We recommend that both IDE hard drives be from the same manufacturer. In a few cases, drives from two manufacturers will not function properly when used together. The problem lies in the two drives, not in the MIO-400KF board.

Preparing an IDE Drive for Use

IDE disk drives are already low-level formatted, with errors entered, when shipped by the drive manufacturer. To use an IDE drive, you will need to enter the drive type (this information is provided by the drive manufacturer) into the system CMOS setup table. Then run **FDISK** and **FORMAT** provided with DOS.

Note:

*Do not run **FDISK** and **FORMAT** programs on a drive that has been prepared, or you may lose all programs and data stored on the drive.*

Game Port

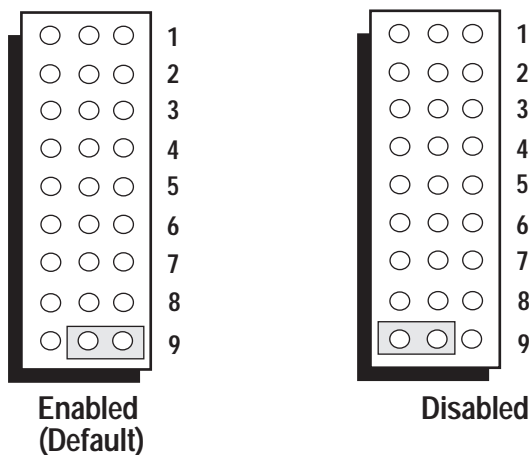
The MIO-400KF board is equipped with a game port. You can use any IBM joystick or compatibles with the MIO-400KF board. Included in the package is a 15-pin game port cable that is connected to connector J3.

Jumper Settings

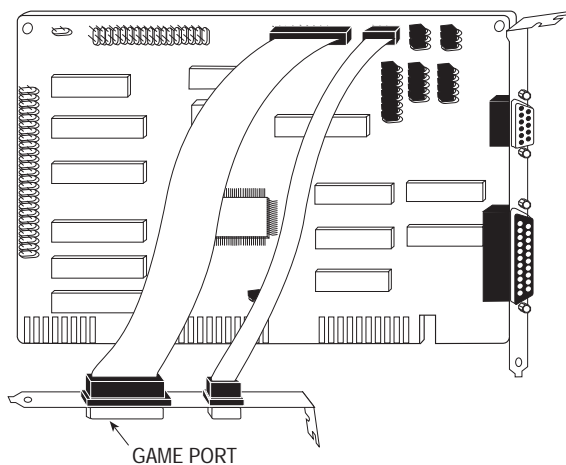
Jumper Block JP3

Game Port Enabled/Disabled

JP3 is a jumper block on the MIO-400KF board that is used to configure the ports and connectors built-in to the board. Row 9 is used to enable or disable the game port. When another game port board is used in conjunction with the MIO-400KF board, the game port function on the MIO-400KF board must be disabled to avoid conflicts with the other game port board.



Connecting the Game Port Cable



The Game Port Connector on the MIO-400KF Board

❖ *Installing the MIO-400KF into your System*

Installation Procedure

For most computer systems, you will only need a medium size Phillips screwdriver to remove the cover.

Caution:

The MIO-400KF board is sensitive to static electricity and has delicate components mounted on it. Before handling the board, discharge any static electricity from your body by touching a grounded object such as a metal screw on the back of your computer system. Handle the board by its edges, and be careful not to twist or flex it.

Step 1: Unpack the MIO-400KF Board

Remove the MIO-400KF board from the shipping carton and its protective packing. Please do not throw away the packing material or the shipping box. You may need these again to prevent damage if you must ship the board for repairs.

Step 2: Switch Off Your Computer's Power

Make sure that your computer is switched off and unplugged before removing the cover. Also turn off any devices (printer, display, modem, etc.) you may have attached to your computer.

Warning:

Hazardous voltages are present and exposed when operating the computer with the cover removed. To prevent equipment damage and personal injury, never apply power to the computer when the cover is off.

Step 3: Remove Your Computer's Cover

Refer to your computer system manual for specific instructions on removing your computer's cover. In general, you will need to remove several screws on the back or side of the system and then slide the cover off.

Step 4: Locate a Free Slot

Insert the MIO-400KF board in any empty 16-bit expansion slot. These slots have end-to-end sockets for the board's edge connectors.

Step 5: Remove the Slot Cover

When a suitable expansion slot is selected, remove the screw and slot cover at the back of the slot. You may have to remove another slot cover beside the first slot cover you've removed for the bracket holding the secondary serial port and game port. Save the slot covers for future use. You will be using the screws in the next step.

Step 6: Insert the MIO-400KF Board

Carefully insert the MIO-400KF board into the chosen slot. When the board's edge-connector is aligned with the connector on the system board, press firmly on the top of the board to seat it.

Viewing the MIO-400KF board from the side, make sure that it is straight and level compared to the computer's system board. Once you are satisfied with its alignment, insert the slot-cover screw in the top of the bracket at the back of the MIO-400KF board.

Also insert the slot-cover screw in the top of the bracket holding the secondary serial port and game port. This should be installed beside the MIO-400KF board, if possible.

Insert your floppy disk drive(s) and IDE hard disk drive(s) to the floppy disk drive connector (J2) and the IDE hard disk drive connector (J5).

Step 7: Replace the Computer Cover

When you have finished installing the MIO-400KF board, put the cover back on your computer. Refer to your computer's system manual for instructions, if necessary.

Step 8: Plug your I/O Devices into the MIO-400KF Board

Plug the peripherals you have to your computer. With the MIO-400KF, two serial ports, one parallel port, and one game port are available for use.

◆ Appendix A: Connector Pin Assignments**Connector J1**

Hard Disk LED Connector

Pin	Assignment
1	LED (+)
2	LED (-)

Connector J2

Floppy Disk Controller

Pin	Assignment
1	Gnd
2	RPM
3	Gnd
4	Reserved
5	Gnd
6	Reserved
7	Gnd
8	Index
9	Gnd
10	Motor Enable A
11	Gnd
12	Drive Sel B
13	Gnd
14	Drive Sel A
15	Gnd
16	Motor Enable B
17	Gnd
18	Dir

Pin	Assignment
19	Gnd
20	Step
21	Gnd
22	Write Data
23	Gnd
24	Write Gate
25	Gnd
26	Track 0
27	Gnd
28	Wr Protect
29	Gnd
30	Read Data
31	Gnd
32	Head Select
33	Gnd
34	Disk Change

Connector J3

Game Port

Pin	Assignment
1	+5VDC
2	+5VDC
3	Button 4
4	Button 6
5	Position 0
6	Position 2
7	Gnd
8	Gnd
9	Gnd
10	Position 3

Pin	Assignment
11	Position 1
12	Button 7
13	Button 5
14	+5VDC
15	+5VDC

Connectors J4/J6

Primary and Secondary Serial Ports

RS-232C Name	Pin	Assignment
CF	1	DCD (Data Carrier Detect)
BB	2	RX (Receive Data)
BA	3	TX (Transmit Data)
CD	4	DTR (Data Terminal Ready)
AB	5	GND (Signal Ground)
CC	6	DSR (Data Set Ready)
CA	7	RTS (Request to Send)
CB	8	CTS (Clear to Send)
CE	9	RI (Ring Indicator)

Connector J5

IDE Hard Disk Interface

Pin	Assignment
1	-Reset
2	Gnd
3	D7
4	D8
5	D6

Pin	Assignment
6	D9
7	D5
8	D10
9	D4
10	D11
11	D3
12	D12
13	D2
14	D13
15	D1
16	D14
17	D0
18	D15
19	Gnd
20	Key
21	Reserved
22	Gnd
23	-IOW
24	Gnd
25	-IOR
26	Gnd
27	IOChrdy (Rsvd)
28	Ale
29	Reserved
30	Gnd
31	IRQ14
32	-IOCS16
33	A1
34	Reserved
35	A0
36	A2
37	-CS0 (1F0-1F7)
38	-CS1 (3F6-3F7)
39	-Active
40	Gnd

Connector J7
Parallel Printer Port

Pin	Assignment
1	-Strobe
2	Data 0
3	Data 1
4	Data 2
5	Data 3
6	Data 4
7	Data 5
8	Data 6
9	Data 7
10	-Ack
11	Busy
12	Paper Empty
13	Select
14	-Auto Foxt
15	-Error
16	-Init
17	-Slctin
18	Gnd
19	Gnd
20	Gnd
21	Gnd
22	Gnd
23	Gnd
24	Gnd
25	Gnd

MIO-400KF Rev. F All-In-One Input/Output Board User's Manual